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### Original article

# Translation into Portuguese and validation of the Blood Donation Reactions Inventory

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#### A B S T R A C T

**Background:** the Blood Donation Reactions Inventory (BDRI) scale was proposed as part of a study about the predictors of psychological reactions in volunteer blood donors, as uncomfortable reactions are associated with a lower probability to return for further donations.

**Objective:** to translate the Inventory into Brazilian Portuguese and evaluate its psychometric properties (validity and reliability). The inventory has 11 items, but the literature suggests that shorter inventories, of four or six items, should be used.

**Methods:** this study was carried out at the blood center of Franca, Brazil. Three people with knowledge of English and familiarity with medical terms translated the Blood Donation Reactions Inventory into Brazilian Portuguese. Aiming to evaluate the objectivity and relevance of the items of the translated instrument, its content was independently evaluated by a panel of eight assessors. After this, data on 1,001 blood donors was collected. Internal consistency was assessed by Cronbach's alpha coefficient. An exploratory factor analysis with varimax rotation was used to analyze the measure for construct validity.

**Results:** the sample consisted of 65.8% men, and 27.3% first time donors. Internal consistency determined by Cronbach's alpha coefficient was satisfactory for the 11, 6 and 4-item scales. Considering the factor analysis, the 11-item scale seems to measure more than one construct as three factors were identified with eigenvalues greater than 1. These factors correspond to 'vasovagal adverse reactions', 'fear' and 'anxiety/excitation'.

**Conclusion:** the Portuguese version of the Blood Donation Reactions Inventory is a valid and reliable instrument for collecting information regarding systemic reactions experienced by blood donors. The 6-item scale seems to be useful when the objective is to measure only vasovagal adverse reactions.

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## Introduction

The maintenance of blood component stocks is a constant challenge for blood transfusion services. Recruitment strategies of blood donors must aim to ensure the necessary number of donors considering seasonal variations in the number of donations,<sup>1</sup> and to focus on the quality of the material collected. In this context, the search for repeat blood donors is essential, as those tested and retested donors provide blood bags with a greater safety margin for the recipient, a smaller number of discarded blood components,<sup>2</sup> and a lower number of positive test results in the screening for infectious diseases.

The loyalty of blood donors can be enhanced using strategies that increase donation accessibility,<sup>3</sup> training the professionals at the blood centers,<sup>4</sup> and fulfilling the expectations and increasing the satisfaction of the donors regarding the service provided.<sup>4-7</sup> The literature shows that factors associated with the return of a blood donor for further donations are Rh factor,<sup>8</sup> age,<sup>8,9</sup> education,<sup>8-10</sup> and gender.<sup>9</sup> In addition, some authors have also highlighted the need to pay attention to the physical effects of blood donation,<sup>10</sup> as uncomfortable reactions are associated with a lower probability to return for further donations.<sup>11,12</sup> Among these reactions are fainting, vertigo and dizziness.

The Blood Donation Reactions Inventory (BDRI) scale was proposed as part of a study about predictors of psychological reactions in volunteer blood donors.<sup>13</sup> The scale consists of 11 items, each corresponding to a reaction or feeling regarding the latest blood donation: (1) faintness (such as feeling faint or losing consciousness), (2) dizziness, (3) weakness, (4) facial flush, (5) visual disturbance (such as blurred vision or tunnel vision), (6) difficulty hearing, (7) lightheadedness, (8) rapid or pounding heartbeat, (9) sweating, (10) rapid or difficult breathing and (11) nausea or upset stomach. Donors answer questions on these items after a donation using the 6-point Likert scale ranging from 0 ('not at all') to 5 ('to an extreme degree'). Thus, higher values are associated with greater reaction intensity. The responses are summed to the final score producing values between 0 and 55.

The psychometric properties of BDRI were evaluated by France et al.,<sup>14</sup> who found high internal consistency for the scale, concurrent validity with other measures of reactions to blood donation and construct validity supported by a factor analysis. This study further showed that an abbreviated version of the BDRI containing only items 1, 2, 3 and 7 of the original instrument would have good psychometric properties and could replace the original scale of 11 items. France et al. also concluded that BDRI is brief, easily understood by donors, and quick to administer and score.<sup>14</sup>

In another study, France et al.<sup>15</sup> showed that high BDRI scores are associated with a significant reduction in the probability of return of blood donors, suggesting that the instrument is an effective tool for predicting whether a donor will make further donations.

Routinely, the blood donors at the Regional Blood Center (Hemocentro) of Ribeirão Preto, Brazil, and at its satellite units, are observed during donation by a nurse who provides additional care to those who experience an adverse

reaction or accident during blood collection. When a blood donor presents an adverse reaction, the nurse completes a standard form entitled 'Notice of Adverse Reaction during Donation' (NARD). The nurse writes on this form which systemic reactions were experienced, their intensity, vital signs and other signs and symptoms, including possible incidents during blood collection. After completion, the nurse is responsible for adding data to the donor's record so that professionals performing the screening of future donations are informed about the incident. The translated version of BDRI does not intend to replace the NARD because its purpose is different. While the NARD allows routine monitoring of adverse reactions, the BDRI is useful for studies that evaluate reactions aimed to, for example, establish strategies to increase blood donor satisfaction and retention. In this context, France et al.<sup>15</sup> cite some disadvantages of the measures based on the observations of the professionals responsible for blood collection in predicting the return of the donor. These professionals may not be able to detect subjective symptoms such as dizziness, vertigo, stress, nervousness or even excessive distress of the person who has a sharp object in his/her arm, and consequently cannot assess the intensity of the donors' reactions. This means that a 'slight' sensation perceived by the nurse may be so uncomfortable for the donor as to influence his/her decision not to return for further donations. Given that the BDRI assesses the experience from the perspective of the donor, it is more sensitive to the intensity of the reaction.

Thus, the objective of this study was to translate the BDRI into Brazilian Portuguese and study internal consistency, criteria, and construct validation of the translation. In this study, the 11-item version of the BDRI and the abbreviated 6-and 4-item versions proposed by France et al.<sup>14</sup> will be considered. The 6-item scale considers items 1, 2, 3, 5, 7 and 11 of the original instrument with the respective total score ranging from 0 to 30 points. The 4-item scale considers items 1, 2, 3 and 7 with the respective total score ranging from 0 to 20 points.

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## Methods

### Translation

First, three people with knowledge of English and familiarity with medical terms independently worked on the translation of the BDRI scale. It was intended that the meaning of the 11 terms describing the feelings and reactions of each item of the instrument had a literal correspondence between the original English version and the Portuguese translation. This resulted in three different versions, which were later compared in order to produce a final consensual version considering cultural aspects of the target population. Thus, the relevance, appropriateness, and acceptability of the style employed were reevaluated given that the educational and socioeconomic levels are highly variable in the population for which the instrument is intended.

### Content validation

Aiming to assess the objectivity and relevance of the items of the translated instrument, its content was independently

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